

ASSIGNMENT 4

Date	29 October 2022
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QUESTION:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 CMS send "alert" to IBM cloud and display in device recent events.

CODE:

```
#include <WiFi.h>

#include <PubSubClient.h>

void callback(char* subscribe topic, byte* payload, unsigned int
payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "qkg8nh"//IBM ORGANITION ID

#define DEVICE_TYPE "abcd"//Device type mentioned in IBM Watson IOT
Platform #define DEVICE_ID "1234"//Device ID mentioned in IBM Watson IOT
Platform

#define TOKEN "12345678" //Token

String data3;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/Data/fmt/json";

char subscribetopic[] = "iot-2/cmd/test/fmt/String";

char authMethod[] = "use-token-auth";
char token[] = TOKEN;
```

```
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
```

```
DEVICE_ID; WiFiClient wifiClient;
```

```
PubSubClient client(server, 1883, callback
```

```
,wifiClient); const int trigPin = 5;
```

```
const int echoPin = 18;
```

```
#define SOUND_SPEED 0.034
```

```
long duration;
```

```
float distance;
```

```
void setup() {
```

```
  Serial.begin(115200);
```

```
  pinMode(trigPin, OUTPUT);
```

```
  pinMode(echoPin, INPUT);
```

```
  wificonnect();
```

```
  mqttconnect();
```

```
}
```

```
void loop()
```

```
{
```

```
  digitalWrite(trigPin, LOW);
```

```
  delayMicroseconds(2);
```

```
  digitalWrite(trigPin, HIGH);
```

```
  delayMicroseconds(10);
```

```
  digitalWrite(trigPin, LOW);
```

```
  duration = pulseIn(echoPin, HIGH);
```

```
  distance = duration * SOUND_SPEED/2;
```

```
  Serial.print("Distance (cm): ");
```

```
  Serial.println(distance);
```

```
  if(distance<100)
```

```
{
```

```
  Serial.println("ALERT!!");
```

```

delay(1000);

PublishData(distance);

delay(1000);

if (!client.loop()) {

  mqttconnect();

}

}

delay(1000);

}

void PublishData(float dist) {

  mqttconnect();

  String payload = "{\"Distance\":\"";

  payload += dist;

  payload += "\",\"ALERT!!\":\"\"Distance less than

  100cms\"\"\"; payload += "}";

  Serial.print("Sending payload: ");

  Serial.println(payload);

}

if (client.publish(publishTopic, (char*) payload.c_str()))

{ Serial.println("Publish ok");

} else {

  Serial.println("Publish failed");

}

}

void mqttconnect() {

  if (!client.connected()) {

    Serial.print("Reconnecting client to ");

    Serial.println(server);

    while (!client.connect(clientId, authMethod, token))

```

```

{ Serial.print(".");

delay(500);

}

initManagedDevice();

Serial.println();

}

}

void wificonnect()

{

Serial.println();

Serial.print("Connecting to ");

WiFi.begin("Wokwi-GUEST", "", 6);

while (WiFi.status() != WL_CONNECTED) {

delay(500);

Serial.print(".");

}

Serial.println("");

Serial.println("WiFi connected");

Serial.println("IP address: ");

Serial.println(WiFi.localIP());

}

void initManagedDevice() {

if (client.subscribe(subscribetopic)) {

Serial.println((subscribetopic));

Serial.println("subscribe to cmd OK");

} else {

Serial.println("subscribe to cmd FAILED");

}

}

}

```

```

void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength) {

Serial.print("callback invoked for topic: ");

Serial.println(subscribetopic);

for (int i = 0; i < payloadLength; i++) {
//Serial.print((char)payload[i]);

data3 += (char)payload[i];

}

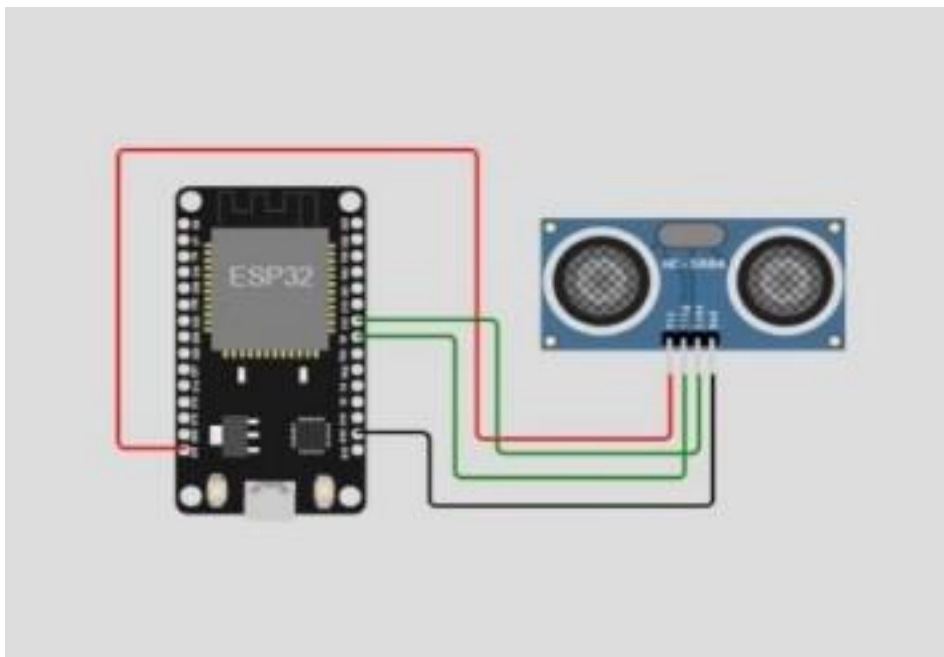
Serial.println("data: "+ data3);

data3="";

}

```

SCHEMATIC/CIRCUIT DIAGRAM:



OUTPUT DIAGRAM:

WOKWI LINK:

<https://wokwi.com/projects/348561029451481683>

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	
<input checked="" type="checkbox"/>	gps	Connected	Node	Device	Nov 17, 2022 1:27 PM	→ ...

Identity

Device Information

Recent Events

State

Logs

X

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Distance":79.97,"ALERT!":"Distance less than ...	json	a few seconds ago